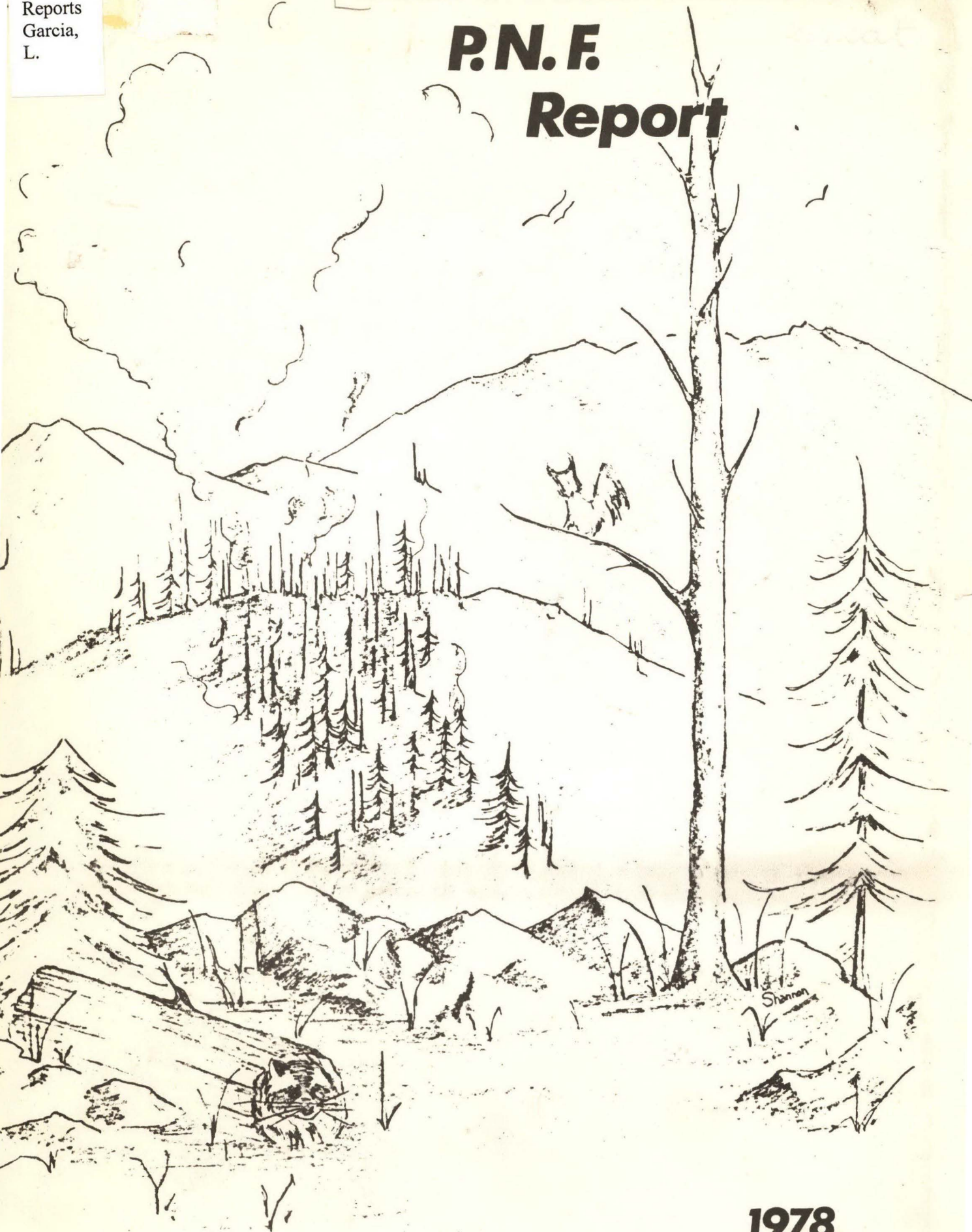


GILA National Forest

P.N.F.

Report



1978

GILA NATIONAL FOREST
ANNUAL REPORT
PRESCRIBED NATURAL FIRE

Prepared By:

Lawrence Garcia
(Wilderness District FMO)

Prepared By:

Cliff Cludge
(Asst. Forest Dispatcher)

Prepared By:

George Egan
(Forest Dispatcher)

Prepared By:

H.R. Webb
(Forest Fire Management Officer)

Approved By:

Alasay
(Wilderness District Ranger)

2/20/79
(Date)

Approved By:

Robert M. Williams
(Forest Supervisor)

2/20/79
(Date)

1978
PROGRESS REPORT
GILA NATIONAL FOREST PRESCRIBED NATURAL FIRE POLICY

INTRODUCTION:

The purpose of this report is to provide an update on the progress of implementation for the Gila Wilderness Prescribed Natural Fire Policy.

The report attempts to briefly cover the date of implementation March 17, 1975, through the 1978 burning season. An effort has been made to present statistical data, facts, assumptions and a few of our concerns for the future.

BACKGROUND AND HISTORY:

The following is a portion of the October 25, 1974 approved E.A.R. describing the reasons for implementation of our present P.N.F. Policy:

"We propose to permit lightning fires to continue burning during the summer rainy season and/or when the measured fire danger meets the requirements necessary to achieve the desired results. It is estimated that during a normal year there will be 89 days when the fire danger is such that natural fires can be allowed to continue burning. Approximately 15 to 25 fires will occur during this period. It should be noted that the weather, including lightning, is extremely variable within the Wilderness, therefore the number of fires started by lightning during the desired period will vary greatly from year to year.

Since time eternal, fire has had a profound influence upon various plant communities of the Gila Wilderness. In most forested areas there is scarcely a spot that has not been in some way affected by fire at one time or another. As a natural component of the environment, fire played an important role in maintaining a wide variety of plant communities. The drastic reduction in acreage burned, through efficient fire control, has altered some of the natural ecosystems that would have prevailed if fire had not been restricted. The gradual replacement of the aspen stands by mixed conifer is the best example of a plant community being eliminated due to fire control activities.

Efficient fire control has resulted in an unnatural condition that could create catastrophic results if all fires were allowed to go unattended. Consequently, this proposal will permit natural fires, when predetermined fire danger conditions are met. The lightning fires which are allowed to burn will gradually begin to restore the Gila Wilderness to a more natural condition.

Requirements which must be met in order to allow lightning fires to burn will be based on known fire behavior characteristics, environmental effects, and possible threats to life, private property, and areas outside the Wilderness.

2.

The Gila Wilderness, composed of 430,680 acres, is located within the Gila National Forest in Southwestern New Mexico. The Mogollon Mountains are a major land feature covering the western half of the area. Other smaller ranges east of the Mogollons are the Jerky Mountains and Diablo Range, located to the north and south of the West Fork Gila River. The northwestern end of the Pinos Altos Range is within the southern tip of the Wilderness. The upper basin of the Gila River and its forks cover 89 percent of the Wilderness. Tributary streams of the San Francisco River drain 11 percent.

A distinguishing characteristic of the Gila Wilderness is the volcanic rock escarpments along the major drainages with many pinnacles and spires. Another outstanding feature is the largest stand of virgin ponderosa pine in the world, under continuous protection of wilderness and primitive classification.

The Gila Wilderness offers much in the way of wilderness character with many of its remote sections seldom if ever, visited by man. Its mosaic of many different vegetation types, climatic conditions and topographic features offers an outstanding challenge for visitors, enriched by abundant solitude. The variety of plant and animal life, supported by widely varied ecologic niches, provides a greater opportunity for informal nature study and scientific study than is available in most southwestern wildernesses. The land forms, vegetation types, and climatic conditions are very well described in the Gila Wilderness Management Plan and Multiple Use guide so this material is not repeated here. (These documents are presently being finalized for public review.)

Over the past 20 to 30 years natural ecological changes have been disrupted as a result of progressively more efficient fire control and excessive use by livestock and wildlife. The resulting replacement of open grass areas with pine and juniper growth and open parklike stands of pine with thick stands of reproduction have changed the character of this wilderness.

Perpetuation of natural vegetation types, with minimal influence of man, is a difficult task. Man's past influence has resulted in altered wilderness plant communities. Excessive livestock and wildlife use has been alleviated through management, and the remaining livestock problems can be corrected through number adjustments and improved management. Fire has not been allowed to operate as a natural factor.

Fire was once a natural component of wilderness ecology. Immediate return to a complete regime of letting fire play its natural ecological role would be an unwise decision. Buildup of ground fuels through portions of the wilderness vulnerable to wildfire would make noncontrol of all fires impossible without disastrous results. On the other hand,

controlling all wildfires perpetuates the continued build-up of debris and the associated problems that occur as a result of this build-up. Neither extreme is desirable for restoration of the original and natural characteristics of wilderness vegetation types."

OBJECTIVES OF THE GILA WILDERNESS PRESCRIBED NATURAL FIRE POLICY ARE:

- (1) Let fire play a more natural role in maintaining a wide variety of plant communities, and reduce natural fuel accumulations.
- (2) Let fire play a greater role in restoring what has been termed the natural wilderness ecosystems.
- (3) Permit natural fire to once again become a component of wilderness ecology.

While working toward these long range objectives we will develop other planning elements, such as: Fire's specific effect on vegetation types and energy release component role.

1975 PROGRESS SUMMARY

On March 17, 1975 the Chief of the Forest Service approved our first preattack block, "8F", for the Gila Wilderness allowing us to implement our Prescribed Natural Fire Policy. Preattack block "8F" consisted of 32,300 acres, the primary fuel type is ponderosa pine and it is geographically located in a high lightning occurrence area.

On July 21, 1975, the Gila implemented P.N.F. Policy by allowing the first lightning fire to burn without suppression action. A total of four fires were declared P.N.F. during July and August of 1975. Three of these fires went out as snag fires, the fourth fire reached 1 acre in size before it went out.

1975 P.N.F. Occurrence				Table 1					
FIRE NAME	DATE DISCOVERED	PREDICTED B.I. AT DISC	PREDICTED ERC AT DISC	FUEL SIZE	SLOPE TYPE	CLASS	ASPECT	% CONSUMPTION	DATE OUT
DIABLO	7/21/75	*6	13	snag fir	2	NW		-	7/25/75
STRAW	7/23/75	*6	13	snag P.P.	1	N		-	7/25/75
PARK	7/23/75	*6	13	snag P.P.	2	W		-	7/25/75
RAW	8/11/75	*8	17	1 Ac P.P.	2	NE		?	8/14/75

* Actual B.I., Predicted not available

1976 PROGRESS SUMMARY

On June 11, 1976, the Forest received approval to add Preattack block "8B" to the P.N.F. area. Block "8B" is adjacent to Block "8F" and consists of 28,160 acres. The approval of this second block increased our P.N.F. area to 61,480 acres.

The predicted weather conditions played a disappointing role in three of our 1976 P.N.F. ignitions. The predicted burning index required complete suppression action. The "Langstroth" Prescribed Natural Fire was detected July 28, 1976, at 1252 MDT. Location: T12S, R16W, Section 8, SW $\frac{1}{4}$. Reported size - Snag, burning at base. Predicted BI - 5. August 3, 1976, the fire was reported at .5 acres, Predicted BI - 6. August 5, 1976, the fire was reported at 5 acres, spreading downslope, hot-spots on SE & SW flanks, no fire in crowns and consuming materials on ground. However, due to our then current prescriptions, and the predicted BI for August 6th was 14 (one point above our mid-point of 13) suppression action had to be implemented.

The same action was required for the "Grizzly" and "Flat" Prescribed Natural Fires. They were initially detected August 3 and 4, 1976, respectively. Complete suppression action was taken August 5, 1976.

September 18, 1976, was the origin date of the "Block" Prescribed Natural Fire. Location: T12S, R16W, Section 36. A BI of 10 was predicted for 9/19/76. Fire reported as not doing much. September 20, 1976, BI 6 the "Block" Fire was reported as approximately 5 acres in size, burning relatively hot on east side of fire - all perimeters still were showing smoke. Lots of rim rock above fire. Good potential for spread if hot material rolled downhill into Mogollon Creek. Consumption of large logs looked good, about 6 snags were burning, nothing had torched out.

The overall weather conditions reported, from the fire, for 9/23/76 to 9/25/76 can be summarized as:

Dry Bulb Temp. - A.M. Average - 54^o; P.M. Average - 68^o
 Wet Bulb Temp. - A.M. Average - 51^o; P.M. Average - 55^o
 Relative Humidity - A.M. Average - 81%; P.M. Average - 48%
 Winds - Variable with maximum speed of 10 mph

The "Block" Fire had consumed all of the available fuels by 9/25/76. The only fire remaining was in the stumps and small duff beds well inside the burned area. The ground surveillance crew was returned to their home unit on 9/25/76, and the "Block" Fire was declared out 9/27/76.

Fuel consumption showed a decrease in ton/acre. Samples taken from inside the burn tallied 2.6 tons/acre, and samples taken outside and adjacent to the burn tallied 3.7 tons/acre. Thus, a reduction of 1.1 tons/acre.

1976 P.N.F. OCCURRENCE

TABLE 2

FIRE NAME	DATE DISC.	PREDICTED BI AT DISC	PREDICTED ERC AT DISC	SIZE	FUEL TYPE	SLOPE CLASS	ASPECT	% FUEL CONSUMPTION	DATE OUT	REMARKS
CATRON	7-13-76	4	6	SNAG	P.P.	1	FLAT		7-14-76	
LANG	7-19-76	6	12	SNAG	P.P.	1	FLAT		7-22-76	
HORSE	7-19-76	6	12	SNAG	P.P.	2	N.E.		7-21-76	
HALF MOON	7-21-76	7	11	SNAG	P.P.	2	E.		7-25-76	
TURNBO	7-21-76	7	11	SNAG	P.P.	1	FLAT		7-23-76	
POND	7-22-76	7	10	SNAG	P.P.	3	E.		7-25-76	
WILDERNESS	7-26-76	5	10	SNAG	P.P.	2	S.		8-1-76	
LANGSTROTH	7-28-76	5	10	29	P.P.	3	S.	70-75%	8-16-76	Suppressed
GRIZZLY	8-3-76	6	11	.1	P.P.	3	N.W.	50%	8-5-76	Suppressed
FLAT	8-4-76	11	22	5	P.P.	1	FLAT	60-70%	8-5-76	Suppressed
BOB	8-13-76	9	14	SPOT	P.P.	2	N.		8-14-76	
GREEN	8-13-76	9	14	SPOT	P.P.	2	N.		8-15-76	
BLOCK	9-18-76	8	15	7.5	P.P.	3	S.E.	60-70%	9-27-76	

Analysis of Burning Index vs. Energy Release Component.

When complete suppression action had to be taken on the "Langstroth", "Flat", and "Grizzly" Prescribed Natural Fires we began to wonder if the prescriptions may be too restrictive.

Thinking at that time directed focus to the spread and energy release components. A suggestion was made to use the "FIRDAT" system to guide an analysis. The Gila National Forest started reviewing the role of the Energy Release Component in relationship to the Burning Index. However, more comparative data was needed before a relationship could be established.

Recommendation for Improving the PNF Prescription.

On October 20-22, 1976, Research Forester, John H. Dieterich, made a tour of the Prescribed Natural Fire Areas. Mr. Dieterich's recommendations, after visiting the 29 acre "Langstroth" Burn, were to maintain as much data record keeping as possible and that the prescription is about right. However, due to the possible fluctuation of predicted BI's, restrain from complete suppression action if there is a possibility the predicted BI will drop back into prescription. Mr. Dieterich expressed his disappointment that we were unable to get a long term weather forecast that would have informed us that the fire might be slightly out of prescription for a day, but that conditions would change the following day, the fire might go back into prescription, and be permitted to continue to burn. Mr. Dieterich stated, "My feeling is that if the fire goes out of prescription due to low humidities it should not cause much of a problem; if it goes out of prescription because of temporary strong winds, we need to know what fuels are ahead of the fire and when the winds, are expected to subside". In summary, Mr. Dieterich felt the prescription is about right. However, flexibility is needed to permit the fire to burn above the prescription for a short period (1 day) providing the long term forecast indicated a return to approved prescription conditions within one or two days.

Mr. Dieterich compared the effects of this Prescribed Natural Fire with the effects of a fire that occurred June 1974, not far from the August, 1976 "Langstroth". He noted that the "White" Fire, that occurred in June, 1974, was more intense and spotted long distances and caused damage to the overstory. The "Langstroth" P.N.F. crowned, in dense patches of regeneration, as it slowly progressed upslope. Once it got onto a flat area only ground fuels were consumed. There was some mortality in young growth, due to heat, and thus created small openings. Mr. Dieterich's estimates of fuel consumption are:

- 2-3 ton/acre of litter
- 4-5 ton/acre of 1"-3" size class
- 4-5 ton/acre of 3"+ size class
- for a total of 10-13 ton/acre of fuel.

7.

On December 23, 1976, the Forest submitted the following proposal to modify our action plan:

Proposal for Action Plan Modification

Insuring that prompt suppression action is taken should any criteria or prescription be negated.

- a. Where criteria are negated (2) two actions are possible.
 - 1. Total Suppression of the fire.
 - 2. Partial suppression - this applies only where the fire is threatening to escape from the approved preattack blocks or the wilderness. In these cases it is possible to suppress only that part threatening to escape (provided all other criteria and the prescription are still being met).
- b. When the prescription is negated two (2) actions are possible.
 - 1. Total suppression of the fire.
 - *2. Delayed Suppression - The initial attack force will be dispatched to the fire when the measured fire danger exceeds the approved prescription. The initial attack force, upon arrival to the fire, will relay detailed information to the Forest Supervisor, or his designated representative pertinent to on-site conditions. This information shall include but not be limited to the following: (a) fire intensity, (b) resistance to control, (c) topographical features, (d) on-site weather observations.

The Forest Supervisor or his designate can delay suppression action based on long term weather predictions and on-site burning conditions. This delay can be implemented when long term weather predictions indicate the measured fire danger will return to the approved prescription within a few days. This delay action can be approved when the objectives of the Prescribed Natural Fire program are being met.

The initial attack force then becomes a ground surveillance team.

The financing and duties of the team will be in accordance to (FM) Fire Management Planning.

* Proposed Modification

8.

1977 PROGRESS REPORT

February 1, 1977 the Chief approved our request for the above modification.

The Forest did not receive approval for any additional preattack blocks for the 1977 season. However, they did have blocks "8C" and "6R" in for approval, consequently the P.N.F. area remained the same size as in 1976, 61,480 Ac.

The following is a report submitted by the ground monitoring crew assigned to the "Rain" Fire: T12S, R17W, Sections 23 and 24, elevation 8200' to 9000', which occurred in Block "8B".

On July 30, 1977 at 1736 MDT, a smoke was reported in Block "8B" by Mogollon Baldy Lookout. At 1754 MDT helicopter 8 returned from helispot maintenance on the Silver City District. Lawrence Garcia, Helitack Foreman, and three men were sent to observe the smoke with instructions to check the boundary line of Block "8B" to determine whether the fire was inside the Block or, if not, to take suppression measures. The legal was changed to T12S, R17W, Section 23 by the Helitack Foreman and the location was verified to be in P.N.F. Block "8B".

The weather at Gila Center on July 30 was as follows:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Bulb</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>Dir.</u>	<u>mph</u>	<u>Max.</u> <u>Temp</u>	<u>Min.</u> <u>Temp</u>	<u>Actual</u> <u>B.I.</u>
90	66	54	30	SE	4	91	54	8

Upon arrival of helicopter 8 at Gila Center at 1853 MDT Lawrence Garcia's report of the fire to the Dispatcher was as follows: Estimated size: ½ acre; Aspect: North; Slope: 40%; Fuel type: P.P. and Duff; Direction of spread: West; all fire lying low to ground; and Recommendation: allow to burn.

On August 1, the "Rain" P.N.F. was observed by heliport manager Greg Hudson.

On the same day, helitack foreman Garcia and five helitack personnel were assigned fire duties in California.

Greg Hudson's report was as follows: Estimated size: 15-18 acres; Aspect: North; Slope: 40%; Fuel type: PP and Duff; Direction of Spread: West & East; B.I. at Gila Center: 10. The fire was still creeping and had small flame lengths.

The Dispatcher, in the absence of the Helitack Foreman, District FMO, and District Ranger, advised to man the fire for monitoring purposes on Wednesday, August 3. Greg Hudson and three men proceeded from Rice

9.

Ranch to pack in, with one mule and rations for three days, via the 74 Mountain trail. Hudson stated that he was unable to reach the fire due to rough terrain and returned to Gila Center with the men and pack animal. On August 7, Tom Bates and three men, along with a pack animal, returned to the area via a different route, and were able to reach the fire on August 8.

The fire did most of its spread on August 5, 6, and 7. Weather at Gila Center was as follows for the above days:

	Dry	Wet	Dew		Wind	Max	Min	Actual	
<u>Date</u>	<u>Temp</u>	<u>Bulb</u>	<u>Point</u>	<u>R.H.</u>	<u>Dir.</u>	<u>mph</u>	<u>Temp</u>	<u>Temp</u>	<u>B.I.</u>
8/5	89	62	46	22	N	3	89	50	5
8/6	91	62	44	20	S	3	94	52	8
8/7	79	63	55	43	S	2	94	52	8

On August 8, Bates reported the following: Estimate size: 600 acres; Aspect: North & East; Slope: 40%; Fuel Type: PP and Duff; Direction of spread: North, East, & West. The cover type of this area was aspen, Ponderosa pine and oak brush. This was the primary cover type of the fire and secondary cover types consisted of some Mountain Mahogany, pinon, juniper, and some Douglas fir on the Corral Canyon side.

Bates' observations were as follows: (Table 3)

The Gobbler Canyon portion of the fire, which I observed the most, had not crowned in the taller trees. In most places duff had burned completely. I would estimate that generally 20% to 25% of the dead logs (3" or more in diameter) were consumed. In some areas, 50% to 60% of the logs had burned; in other areas, logs had just been scorched. I noticed that at the top of the ridges that the consumption of the fuels was greater than at the bottom. On the ridge top, most areas of oak brush burned; toward the bottom, the oak brush consumption was generally less.

Toward Judy Canyon, the fire did not burn in the bottom of the canyon, but it did burn on both sides of the canyon. Again, the fire burned moderately; and again, toward the top of the canyon, the fire consumed more fuel than toward the bottom.

In Judy Canyon I could see that the fire had crowned in a thicket of oak brush and also in a dog hair thicket of small Ponderosa pine, 10 to 12 feet high.

On circling out around Gobbler Canyon and heading toward Corral Canyon, I saw a few spots that had burned hot and consumed most of the fuels. This area was at the top of Gobbler ridge.

At Corral Canyon, toward the north end, there was a finger that had burned down the east side of the canyon. This area had burned more

10.

completely than the Judy and Gobbler Canyon areas. This was partly due to heavy fuel and higher brush density. The best burn was the top quarter of the ridge. On the ridge top adjacent to Corral Canyon, some areas had burned well. However, a few spots had not burned. As I walked the burned area, all or most of the duff and litter had been consumed. In certain places all that was left was white ash. Some spots toward the southern part of the ridge didn't burn as hot as the northern part of the ridge.

It rained the nights of August 9, 10, 11, and 12 with a total of 1 inch precipitation received. The fire did not increase in size on those dates and was declared out on August 13. Final size has been determined to be approximately 600 acres.

August 8 through the 12, the average weather was recorded:

<u>Dry</u>	<u>Wet</u>	<u>Dew</u>			<u>Max</u>	<u>Min</u>
<u>Temp</u>	<u>Bulb</u>	<u>Point</u>	<u>R.H.</u>	<u>Wind</u>	<u>Temp</u>	<u>Temp</u>
85	78	52	41	5 mph	90	53

Copies of Fuel Volume transects are not included in this report. However, they indicated the following reductions:

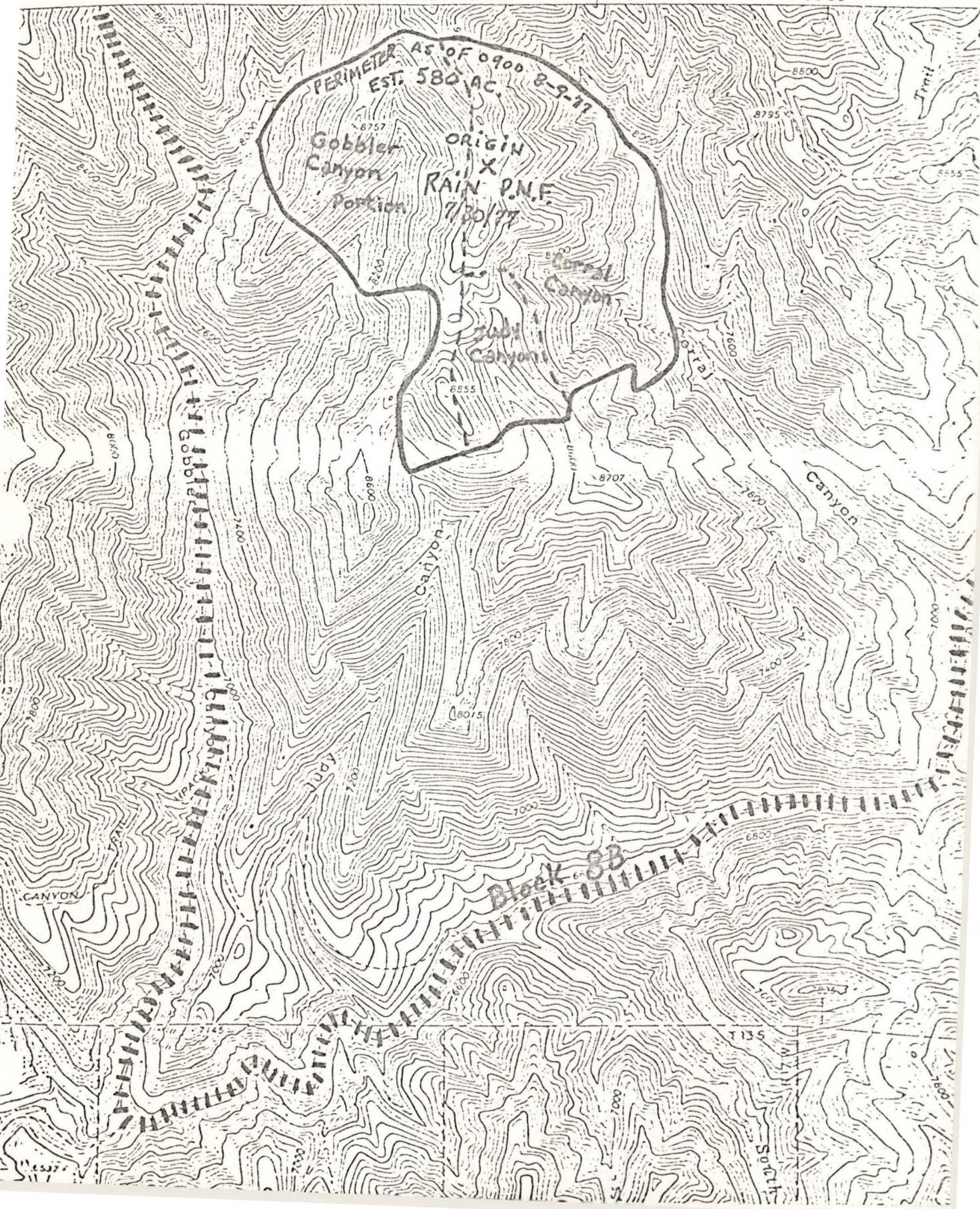
Unburned Area Adjacent to "Rain" Fire	=	15.9 tons P/A Average
Burned Area "Rain" Fire	=	<u>- 5.2</u> tons P/A Average
Average Total Reductions	=	10.7 tons P/A Average

726

4250 1 SE
(MOGOLLON BALDY PEAK)

728

32'30"



1977 P.N.F. OCCURRENCE										TABLE 4
FIRE NAME	DATE DISC.	PREDICTED BI AT DISC.	PREDICTED ERC AT DISC.	SIZE	FUEL TYPE	SLOPE CLASS	ASPECT	% FUEL CONSUMPTION	DATE OUT	REMARKS
MOGOLLON	7-15-77	6	17	SNAG	P.P.	3	S		7-16-77	
BLOCK	7-16-77	8	17	SNAG	P.P.	1	N		7-17-77	
EIGHT	7-16-77	8	17	SNAG	P.P.	1	FLAT		7-17-77	
"B"	7-17-77	8	17	SNAG	P.P. & FIR	1	FLAT		7-21-77	
NAT	7-19-77	3	13	SNAG	P.P.	1	E		7-21-77	
DIABLO	7-20-77	6	15	SNAG	P.P.	1	FLAT		7-22-77	
STRAW	7-21-77	7	10	SPOT	P.P.	2	E		7-22-77	
TOWER	7-22-77	5	8	SNAG	P.P.	2	N		7-23-77	
RAIN	7-30-77	10	21	580	P.P.	3	ALL	55-85%	8-22-77	Burned 23 Days
*BOB	8-7-77	8	12	8	P.P.	1	FLAT	60%	8-9-77	Suppressed due to man- power shortage
JOHN	8-9-77	8	19	SNAG	P.P.	2	N.E.		8-12-77	
CUB	8-31-77	6	17	SNAG	P.P.	1	FLAT		9-1-77	

* The "Bob" Fire was suppressed at 8 acres due to fire activity in California which created a manpower shortage on the Forest, and the fact that "Rain" Fire was active.

13.

1978 PROGRESS SUMMARY

The Regional Forester approved preattack blocks "8C" and "6R" on June 2, 1978, increasing our total P.N.F. area to 115,950 acres.

Due to revisions in the National Fire Danger Rating System, we changed our prescriptions on 8/16/78 as follows:

<u>Fuel Model "C"</u>	<u>Fuel Model "G"</u>
BI 30 or less	BI 32 or less
ERC 25 or less	ERC 28 or less
with a total of 55 or less	with a total of 60 or less

Through actual use we found that the new prescriptions were too restrictive. The formulas were telling us that we were out of prescription and should suppress our fires while our ground monitors were telling us the fires were "doing just what we want them to." The average flame length was 3' to 4' and the flame height was from 2.5' to 3.0'. The P.N.F.'s were doing a satisfactory job of eliminating downed fuel and scorch height was low. The average rate of spread in 1978 was 4.8 chains/hour.

Our next modification was to simply use BI of 45 or lower in the "C" fuel model. This appears to be working quite well.

During the 1978 season, we experienced 22 fires burning 5,947.74 acres. The following are reports submitted from data obtained by ground and aerial crews assigned to the three large fires, "Langstroth", "Nite", and "Trotter".

LANGSTROTH FIRE

The "Langstroth" fire was reported by Black Mountain L.O. on July 29 at 1822 MDT, T12S, R16W, Section 10.

Weather at Gila Center was:

<u>Dry</u>	<u>Wet</u>	<u>Dew</u>		<u>Wind</u>		<u>Temp</u>		<u>Actual</u>
<u>Temp</u>	<u>Temp</u>	<u>Point</u>	<u>R.H.</u>	<u>Dir.</u>	<u>mph</u>	<u>Max</u>	<u>Min</u>	<u>BI</u>
94	61	38	14	NE	5	96	48	34

At 1948 MDT on same day.

District F.M.O. Lawrence Garcia and District Ranger Bob Casey flew the fire, one snag on fire was reported and the decision to let the fire burn was made.

On July 30, the observer plane reported the Langstroth fire had 6" flame length, had consumed 1 log, its perimeter was 30' X 15' and was creeping Northwest up slope. 30 minutes later, the observer reported 2

14.

to 3 times more smoke volume on the Langstroth fire, flames were still low and creeping and looked good.

Weather at Gila Center for July 30, 1978 was:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>Dir.</u>	<u>mph</u>	<u>Temp</u> <u>max</u>	<u>min</u>	<u>Actual</u> <u>BI</u>
91	63	47	22	E	3	98	54	29

On July 31, the "Langstroth" fire had reached 1 acre in size. On August 2, the fire had doubled its size to 2-2.5 acres, and on August 5, the observer plane reported the Langstroth Fire was 10 acres. (See Langstroth Spread Map, P. 25)

Gila Center weather was:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>Dir</u>	<u>mph</u>	<u>Temp</u> <u>max</u>	<u>min</u>	<u>Actual</u> <u>BI</u>
85	63	51	31	N	7	95	52	33

At this time a request was made to send monitors to the "Langstroth" fire. District F.M.O Garcia was unable to comply with the request since there was not personnel and stock available and rain was forecasted for that night and following day.

On August 7, after the fire had received some precipitation, the observer plane reported 1 log burning and rain still falling. The "Langstroth" Fire looked as if it were about to go out.

On August 14, weather at the Gila Center was:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>dir</u>	<u>mph</u>	<u>Temp</u> <u>max</u>	<u>min</u>	<u>Actual</u> <u>BI</u>
82	56	36	19	SW	8	85	48	30

The observer aircraft again suggested monitors, and reported 20 logs were burning.

On August 15, F.M.O. Garica and Asst. Helitack Foreman Hudson were en-route to monitor the burn with supplies for 5 days. Upon arrival, Garcia gave the following report to the Dispatcher: 100 acres mostly on flat country, 6-8 tons fuel per acre, flames on east side, all on ground, scorch 8-10 feet high, east side of fire has gone into Langstroth Canyon, almost to Trail Creek. Flames 1.5" - 2.0' in length. Flame front 150' to 200' wide. The following day, 6 additional personnel were sent to the fire for monitoring and for actual training. The fire at this time was 150 acres.



Photo 1. "Langstroth" Fire. Photo looking west. Langstroth Canyon on left of burn and Mogollon Baldy far right background.

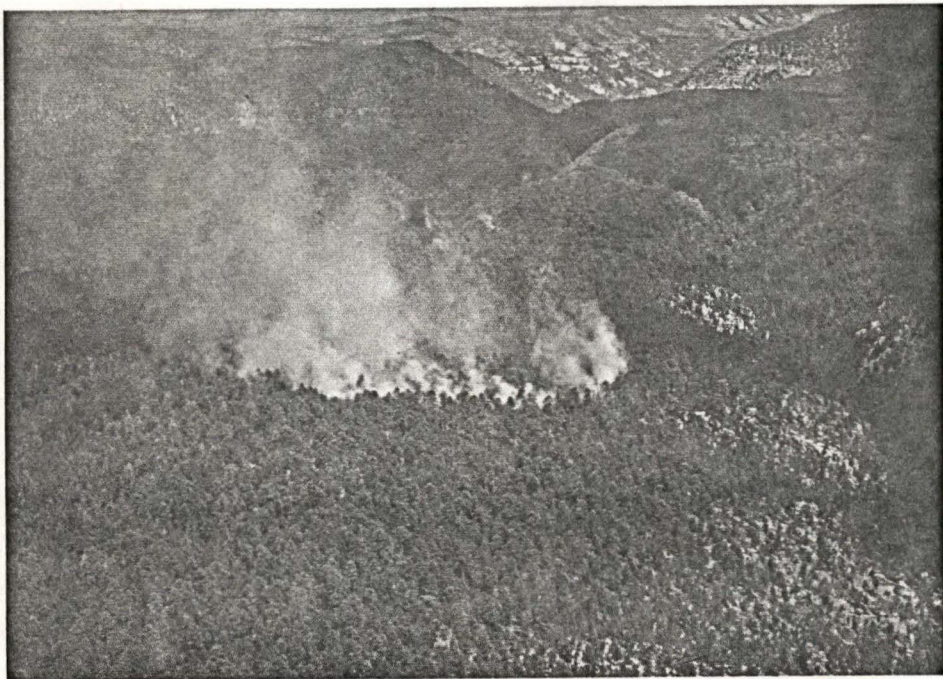


Photo 2. "Langstroth" Fire. Photo looking east. Langstroth Canyon on far right, White Creek upper left with West Fork Gila River is main drainage upper center right.

16.

On August 19, it had started raining on the "Langstroth" Fire, and all monitors were called back to Gila Center.

Gila Center weather was:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>dir</u>	<u>mph</u>	<u>Temp</u> <u>max</u>	<u>min</u>	<u>Actual</u> <u>BI</u>	<u>Precipitation</u>
68	60	56	65	SE	7	89	51	18	.01

On August 27, the observer aircraft reported 1 snag on fire inside the burned area.

The September 5, report on the fire was 5 smokes - mostly stumps - no visible flame. September 6, the "Langstroth" Fire once again became active and reached the size of 300 acres by September 15.

A red flag wind warning was received on September 11; however, the winds did not reach the forecasted wind speeds. Monitors were being readied for return to the fire site.

Gila Center weather:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>dir</u>	<u>mph</u>	<u>Temp</u> <u>max</u>	<u>min</u>	<u>Actual</u> <u>BI</u>
86	53	35	18	SW	12	89	40	26

On September 15, monitors returned to the "Langstroth" fire after several days of high winds, and hot temperatures. Greg Hudson's report is as follows: Aspect slope and fuel are the same; 700 acres; wind 10-12 mph from NW; spread is 6 chains per hour; consumption of fuel is 60%-70%; 50%-60% large log consumption was spread from Langstroth Canyon north to White Creek on mesa and to the head of Rawmeat Canyon.

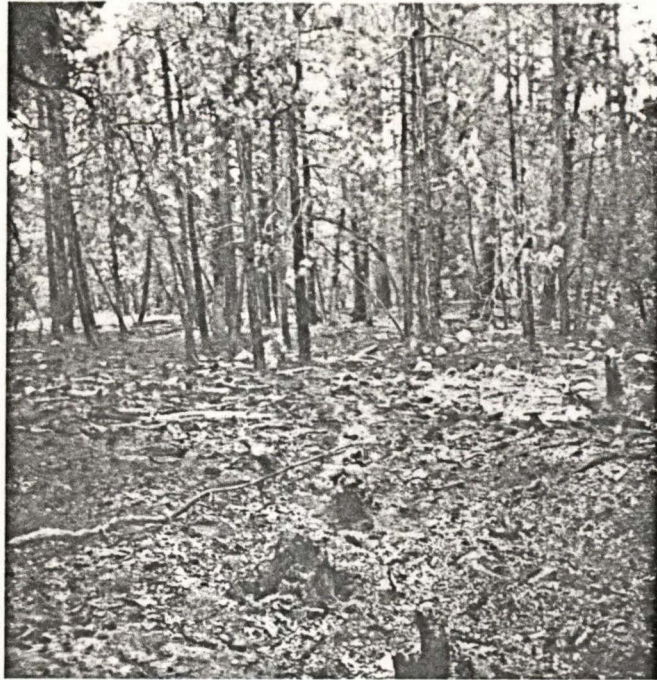


Photo 3 (↑ P3-Spread Map). View to north. Flat Mesa. Light fuels with intermittent 100 HR/TL fuels. Scorch due to lingering heat intensity, not suspected to cause mortality.



Photo 4 (↙ P4-Spread Map). View to west. Continuous light fuels. Scorch in 4' to 5' reproduction and in taller growth due to heat intensity, again not suspected to cause a high percentage of mortality in older or healthier growth.



Photo 5 (↑ P5-Spread Map). View to north looking into side drainage of White Creek. High volumes of 1000 HR/TL fuels in drainage and on north aspect. 1000 HR/TL fuels reduced significantly. Fire burned hottest on all canyon sides. Notice small saplings and tree trunks, needles and bark show small flame heights; however, scorch is apparent from amounts of heat produced. Some mortality can be expected.

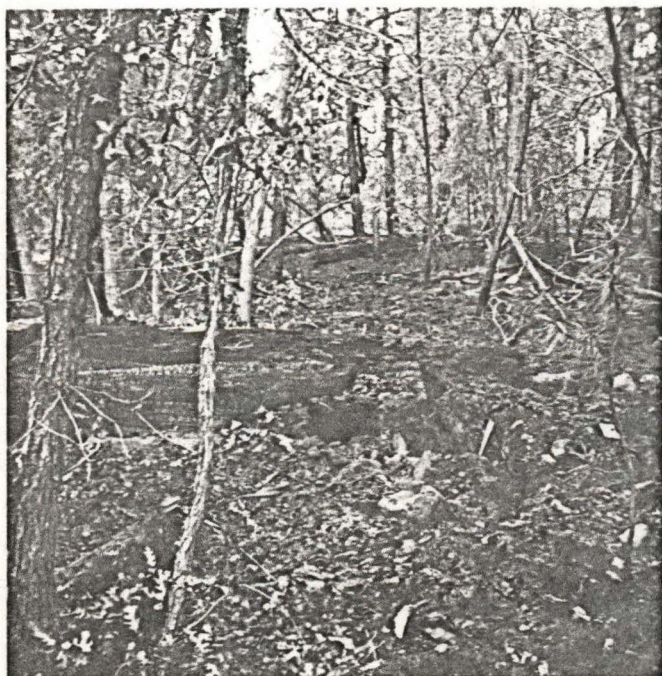


Photo 6 (↓ P6-Spread Map). View to south. Partially consumed downed snag was felled by fire. Already downed snags were consumed, fresh downed snags remained with only partial consumption. Relatively small amounts of scorch.

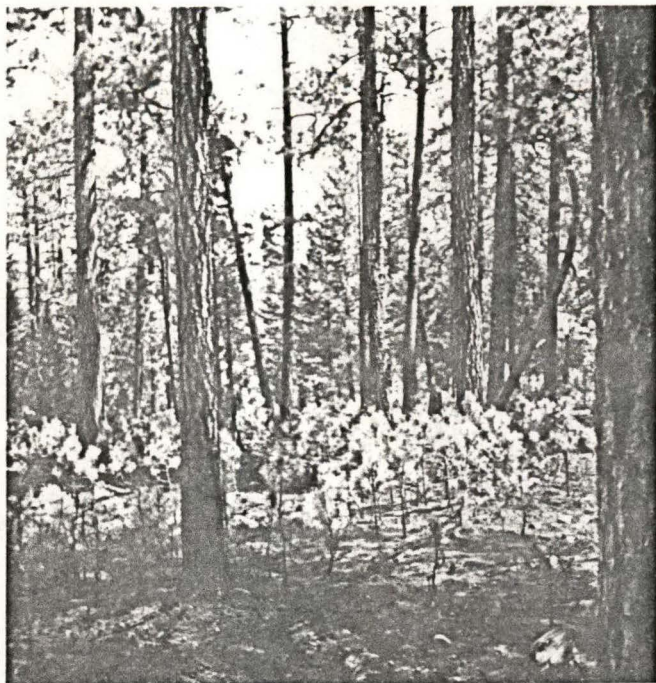


Photo 7 (→ P7-Spread Map). Visible scorch coming out of canyon, with small flame heights. Good consumption of dead fuels. Possible mortality of saplings that could produce open grass areas and enhance wildlife.



Photo 8 (→ P8-Spread Map). View to northeast. This is at fire's edge at time of photo. Excellent example of fuel loading and fuel types of greatest percentage of fire area. This was consumed within fire's perimeter in the next few days.

20.

Monitors returned to Gila Center September 25. Size at this time was 1500 acres.

September 15, thru September 25, is when the "Langstroth" fire did most of its spreading, and there was some confusion as to actual acreage on the fire.

On October 1, monitors again went to the P.N.F.'s after returning from their days off. Activity remained calm, however the fire was still increasing in size. Fuel consumption was 50-60%, with good light fuel and grass consumption.

On October 5, the "Langstroth" fire made another run. The observer plane reported a 20 acre front moving NE with some scorching. A Game and Fish employee reported flames up to 3 foot high. District F.M.O. Garcia made arrangements to take monitors into the "Langstroth" fire on October 19.

Gila Center weather:

<u>Dry</u>	<u>Wet</u>	<u>Dew</u>		<u>Wind</u>	<u>Temp</u>	<u>Actual</u>
<u>Temp</u>	<u>Temp</u>	<u>Point</u>	<u>R.H.</u>	<u>dir</u> <u>mph</u>	<u>max</u> <u>min</u>	<u>BI</u>
78	52	22	21	SE 3	80 36	4

A recon flight was made and the following report was given to the Dispatcher: winds 15-20 mph from South; additional 200 acres consumed; 400' convection column; heavy smoke on fire front which is $\frac{1}{2}$ mile long; 1'-2' flame height; 3' flame length; spread 2-3 chains per hour.

A Wilderness Patrolman, who was on the fire, reported that the fire was staying on the ground; going deep into duff; and doing nothing but good.

On October 10, ground monitor Hank Dominquez reported the following: slope 20% on mesa top, 90% in White Creek; elev. 7800; 1 hr. fuels; 0.5 T/AC; 10 hr. 0.4 T/AC; 100 hr. 4.9 T/AC; 1000 hr. sound 5.0 T/AC; rotten 10.0 T/AC; total 30.6 T/AC. Scorch was 6" to 6'; consumption 50%; light fuel 1.5'; duff 4.7". The fire spread was 6' per minute.

Weather on the Fire:

<u>Max</u>	<u>Min</u>	
<u>Temp</u>	<u>Temp</u>	<u>Winds</u>
80	40	West, 5 mph

Monitors were released from the "Langstroth" fire on October 17, with their estimate on the fire at 3200 acres.

21.

Rain started falling which almost extinguished the fire, with only two smokes reported on October 29, by the observer aircraft.

Summary:

From October 21, to October 26, Gila Center received 1.78" of precipitation and the fire location probably received more.

The "Langstroth" fire burned 3200 acres. The fire is divided into three sites. (see Fuel Volume Map, p.26)

- (1) The broad wedge top accounts for nearly 80% of the area;

$$\text{Average Fuel Volume Calculation } \frac{M}{P.P.G.O} \frac{7-2.0'}{6-1.5''}$$

- (2) 15% was on the steep south-facing slope of Langstroth Canyon.

$$\text{Average Fuel Calculations } \frac{M}{P.P.M.C.} \frac{4.5-1.5'}{3.0-1.5''}$$

- (3) And 5% on the north side slope of White Creek.

$$\text{Average Fuel Calculations } \frac{M}{P.P.M.C} \frac{15-3.5'}{16-2.0''}$$

Consumption on fine fuels, ponderosa pine reproduction, gambel and grey oak was average, live grass consumption, very high, apparent scorch ranged from 4'-6' on south slope, 10' on ridge top and 12'-15' on the north slope. The majority of the larger 3"-12" fuel remaining after the fire are the result of unconsumed freshly fallen snags. 50% to 75% of the snags that fell as the result of the fire were totally consumed. One month after ignition of the "Langstroth" Fire there was 3" to 4" of the pine muhly grass type regrowth over 20% of the area.



Photo 9. Typical fuel loadings on north aspects of canyon walls.

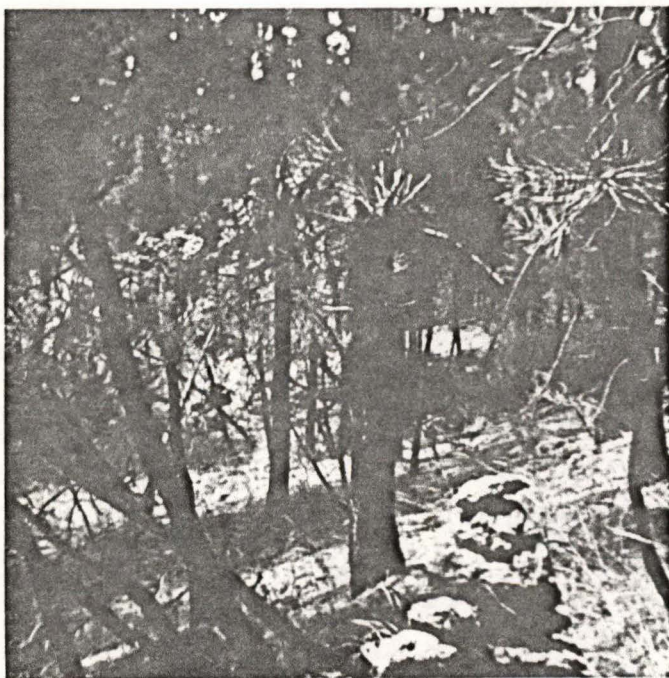


Photo 10. Rock pile in foreground used as focal-point. Again showing fuel loadings and pine reproduction.



Photo 11. Fire spread and typical flame heights and lengths.



Photo 12. Before "Langstroth" Fire had reached this particular area. There was large amounts of duff with some grass types growth. Both sound and rotten 1000 HR/TL + dead fuels, stumps and scattered debris of other fuel sizes.

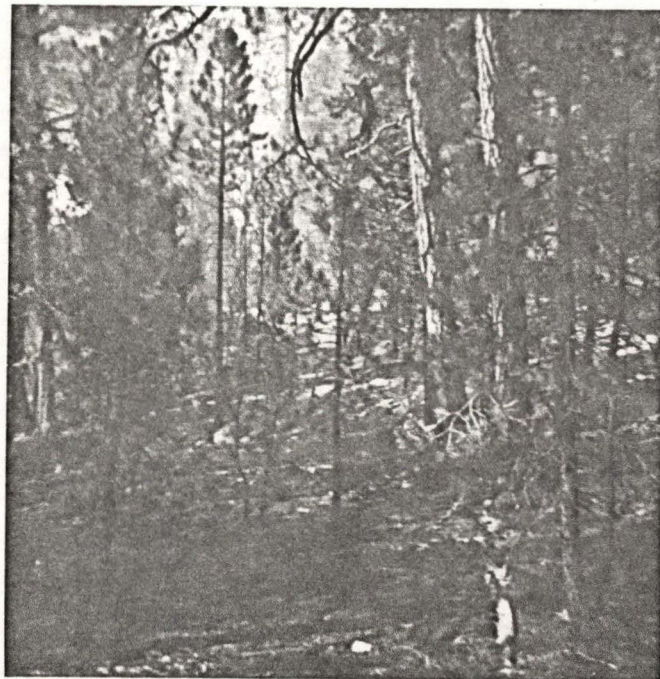


Photo 13. Same area as above after "Langstroth" Fire had passed. Smaller saplings are scorched but have retained needles (lower right near white ashes). Notice large amounts of white ash showing complete consumption of dead fuels.

U B
**LANGSTROTH PRESCRIBED
 NATURAL FIRE
 3,200 AC.**

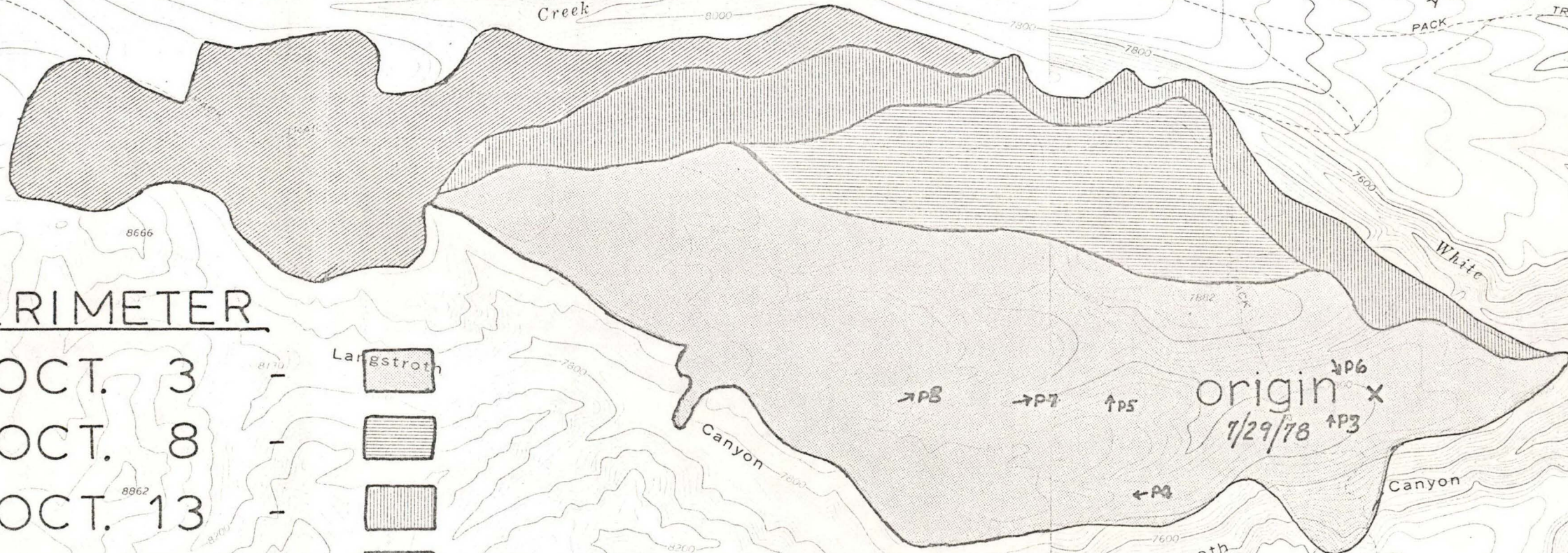
PERIMETER

OCT. 3	-
OCT. 8	-
OCT. 13	-
OCT. 30	-

Photo Pnt. and Direction

Langstroth

→ P2



LANGSTROTH FIRE

NO FUEL LOAD CAL. WERE RUN

NOTE! 1973 FUEL LOAD AVERAGE WERE

M 5 7 TONS
P.P. 2

H 10-15'
P.P. 6-1.7"
H 20-1.9'
P.P. 15-2.0"

M 2-1.5'
P.P. 3-1.0"
M 1-0.5'
P.P. 1-0.3"

M 60-20'
P.P. 5.0-1.5"

NO AFTER FIRE TALLY

M 30-0.6'
P.P.-M.C. 2.5-1.3"
M 45-2.6'
P.P.-M.C. 5.3-3.0"

M 15-3.5'
P.P. 16-2.0"
M 5-1.0'
P.P. 4-0.5"

M 10-20'
P.P. 15-1.5"
M 5-0.5'
P.P. 7-0.6"

M 4.7-1.0'
P.P.-M.C. 4.0-1.6"
M 2.0-0.3'
P.P.-M.C. 1.5-0.7"

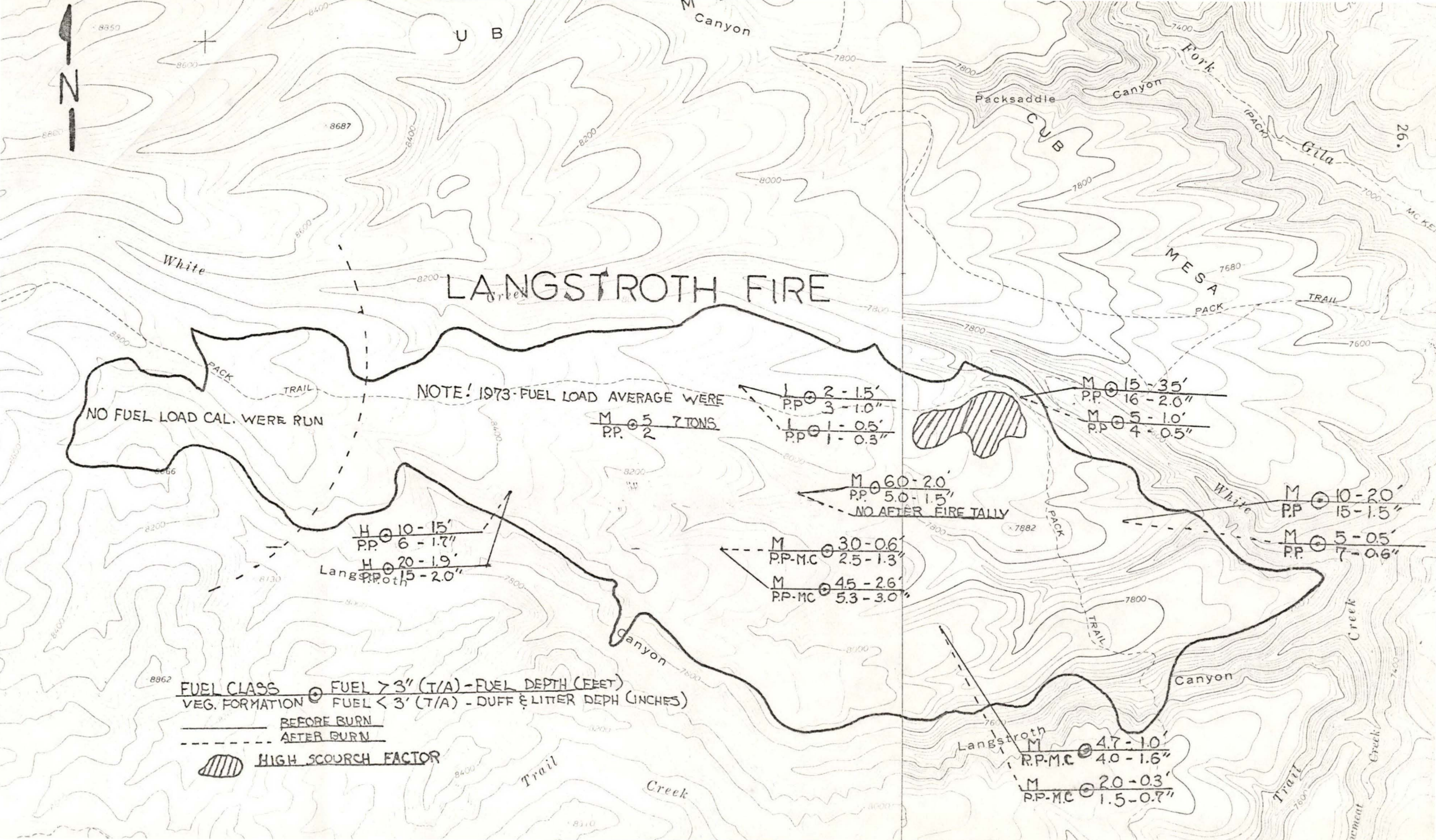
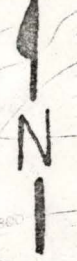
FUEL CLASS FUEL > 3" (T/A) - FUEL DEPTH (FEET)
VEG. FORMATION FUEL < 3" (T/A) - DUFF & LITTER DEPTH (INCHES)

BEFORE BURN

AFTER BURN



HIGH SCOURCH FACTOR



27.

NITE FIRE

The "Nite" fire was reported on August 8, 1978, by Mogollon Baldy Lookout at 0754 MDT, T11S, R16W, Section 16. District F.M.O. Lawrence Garcia flew the fire, which was in Block "8C", and had this following report for the Forest Dispatcher: Elevation 8000 ft, aspect North, fuel type Ponderosa Pine and Gamble Oak, 1 burning area 10' X 10' with one burning snag, we will let it burn. North winds steady 0-5 mph.

Gila Center weather:

<u>Dry</u>	<u>Wet</u>	<u>Dew</u>		<u>Wind</u>	<u>Temp</u>	<u>Actual</u>	
<u>Temp</u>	<u>Temp</u>	<u>Point</u>	<u>R.H.</u>	<u>dir</u>	<u>mph</u>	<u>max</u>	<u>min</u>
85	61	46	21	SE	3	3	25
							8/8 - .33"
							8/9 - .65
							8/10 - .37

On August 12, the observer aircraft reported the "Nite" fire was .25 acre, and on August 14, the observer aircraft reported no change. The report from the observer aircraft was no visible smoke from the "Nite" fire after some moderate showers on August 15.

Gila Center weather:

<u>Dry</u>	<u>Wet</u>	<u>Dew</u>		<u>Wind</u>	<u>Temp</u>	<u>Actual</u>	
<u>Temp</u>	<u>Temp</u>	<u>Point</u>	<u>R.H.</u>	<u>dir</u>	<u>mph</u>	<u>max</u>	<u>min</u>
85	55	20	13	SW	5	88	42
							9

On August 17, the "Nite" fire was reported as .25 acre; some potential; no flame visible but a lot of smoke. The days of August 18 and 19 showed an increase in acreage due to winds and fuels rolling down hill. On August 19 the observer aircraft estimated 17 acres burned with good potential for continued spread.

On August 26, all P.N.F.'s received rain with .22" recorded at Gila Center. On August 28, the "Nite" fire again increased doubled its size with little flame. At the time of observation the "Nite" fire was now reported at 25 acres, burning up-slope with wind.

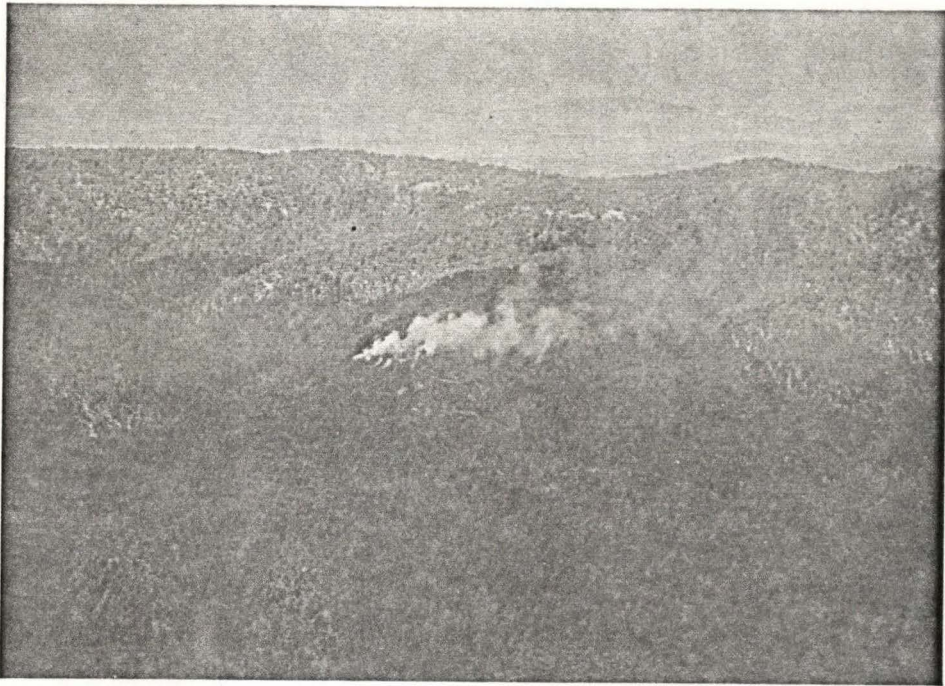


Photo 14. "Nite" Fire. View to northeast. Flames are backing into winds and down slope.



Photo 15. View to southwest and looking down into side drainage of West Fork Gila River (Turkey Feather Creek is drainage in upper left). Some scorch is visible, any other scorch is distorted by smoke.



Photo 16. Closer aerial view of "Nite" Fire. The edge of the fire is backing down slope and into winds. Some scorch is visible. Some flame is barely visible at fire edge.

Gila Center weather:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>dir</u>	<u>mph</u>	<u>Temp</u> <u>max</u>	<u>min</u>	<u>Actual</u> <u>BI</u>	<u>Precipitation</u>
84	62	52	33	S	10	84	49	15	.65

No visible smoke was again reported on September 5, at 1349 MDT.

After the red flag wind warning, of September 11, was received there were no available personnel on the District to monitor the "Nite" fire, they were all committed to the "Langstroth" fire. The "Nite" fire continued to increase in size. (see "Nite" Fire Spread Map, p.31)

The next observation flight on September 28, and reported the "Nite" fire at 250-300 acres and consuming 70% of fuels with low scorch heights, visible flames and good spread potential.

On October 3, Ground Monitor Greg Hudson, reported 300-350 acres; no visible flame; good fuel consumption and returned to "Langstroth" Fire.

30.

Gila Center weather.

Dry Temp	Wet Temp	Dew Point	R.H.	Wind dir	mph	Temp max	min	Actual BI
82	53	25	12	SE	4	87	38	7

20 acres of active fire spreading northeast was reported on October 8, by the aerial observer.

A 60-80 acre increase in total size was calculated. Winds SE 10-15 mph, with smoke convection column of 100', small flames and fire creeping on the ground. Due to other fires which were out of the P.N.F. blocks that needed suppression, monitors were not available, therefore most of the observations were made by aerial observer.

After a rain spell, the acreage and following report was made by Ground Monitors Dominquez and Bates: 860 acres; 60-70% fuel consumption; scorch 4'-6'; dead snag consumption high.

Summary:

The "Nite" fire burned 860 acres. The fire was divided into 2 sites. (see "Nite" Fire Fuel Volume Map, p.32)

- (1) Steep south side of the ridge accounted for 95% of the area.

Average Fuel Volume Calculation $\frac{M}{P.P.M.C.} \frac{2.5-2.0'}{2.0-.15''}$

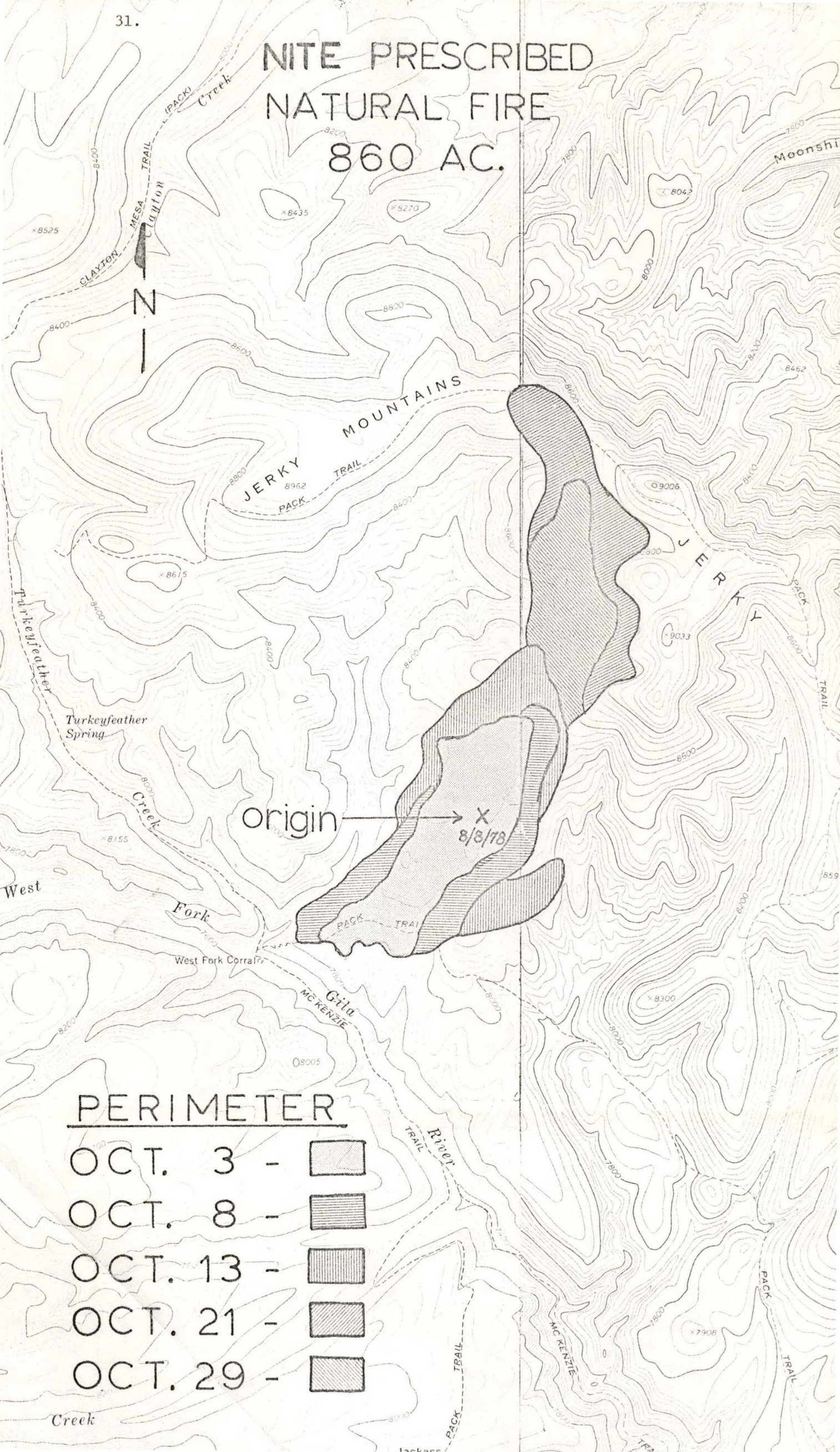
- (2) 5% was on flat near West Fork Corral.

Average Fuel Volume Calculation $\frac{L}{P.P.M.C.} \frac{1.0-2.0'}{2.0-1.0'}$

Consumption of fine fuels, Ponderosa pine reproduction Gamble and grey oak was moderate, live grass consumption was high, apparent scorch averaged 4'-7' on south side and almost nothing on flat area. All fallen snags were 95%-100% consumed.

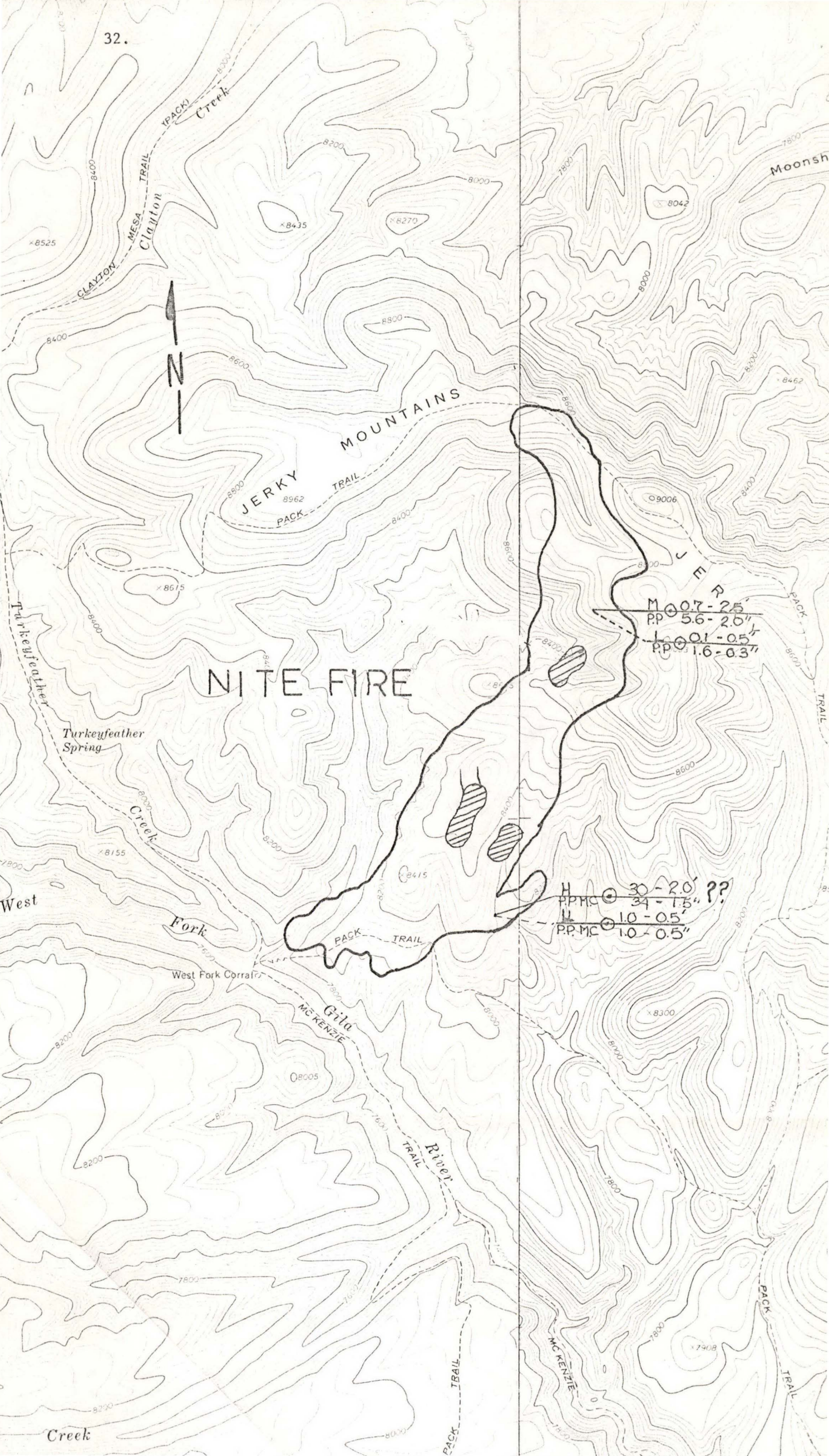
Information is limited on this fire due to the committment of Ground Monitor to the "Langstroth" Fire.

NITE PRESCRIBED NATURAL FIRE 860 AC.



PERIMETER

- OCT. 3 -
- OCT. 8 -
- OCT. 13 -
- OCT. 21 -
- OCT. 29 -



NITE FIRE

M 0.7-2.5
PP 5.6-2.5"
L 0.01-0.5
PP 1.6-0.3"

H 30-2.0' ??
PPHC 34-1.5"
H 1.0-0.5'
PP.MC 1.0-0.5"

TROTTER FIRE

The "Trotter" fire was discovered during a recon flight of all P.N.F's, in T11S, R16W, Section 13, at 1108 MDT, September 28. The report was 15 acres, fire creeping on ground in all directions, bordered with Forest Service Trail #30, which is the Eastern boundry of Block "8C".

On September 30, the "Trotter" fire had reached 100 acres. (see "Trotter" Fire Spread Map, p. 35)

Gila Center Weather:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>dir</u> <u>mph</u>	<u>Temp</u> <u>max</u> <u>min</u>	<u>Actual</u> <u>BI</u>
82	52	21	10	SE 7	88 37	8

On October 1, Ground Monitors Hudson and Dominquez reported the "Trotter" fire at 160 acres; scorch 6' high; spread of 6" per min; flame length and height 6"; good consumption of dead fuels. They corrected the legal to T11S, R15W, Section 7.

Gila Center Weather October 3:

<u>Dry</u> <u>Temp</u>	<u>Wet</u> <u>Temp</u>	<u>Dew</u> <u>Point</u>	<u>R.H.</u>	<u>Wind</u> <u>dir</u> <u>mph</u>	<u>Temp</u> <u>max</u> <u>min</u>	<u>Actual</u> <u>BI</u>
82	53	21	12	SE 6	86 40	7

Aerial Observer Reports for October 3, 5, and 8 are: October 3, very little visible smoke, no change from previous report. October 5, burning on all perimeters, with visible flames on the ground, additional 30 acres burned, good consumption and excellent smoke dispersal. October 8, fire was 200 acres, winds south 5-10 mph, convection column 200' straight-up, 2 active fronts going towards trail, some flame in very light fuel, but mostly smoldering, fuel consumption looks good, no visible scorch.

On October 12, F.M.O. Garcia and Ground Monitor Dominquez reported a 150 acre slop-over of the "Trotter" Fire into Block "8-D", which is not approved for the Prescribed Natural Fire Program. The slop-over was contained by building and back-firing two miles of scratch line. On October 15, an escaped fire situation analysis for the slop-over was developed (see page 37). An additional 6 men were dispatched to the slop-over area and, with a little help from Mother Nature, the slop-over was totally suppressed.

On October 29, after three days of rain the observer aircraft reported two visable smokes, 1 snag, and 1 stump hole, all in P.N.F. Block "8-C".

34.

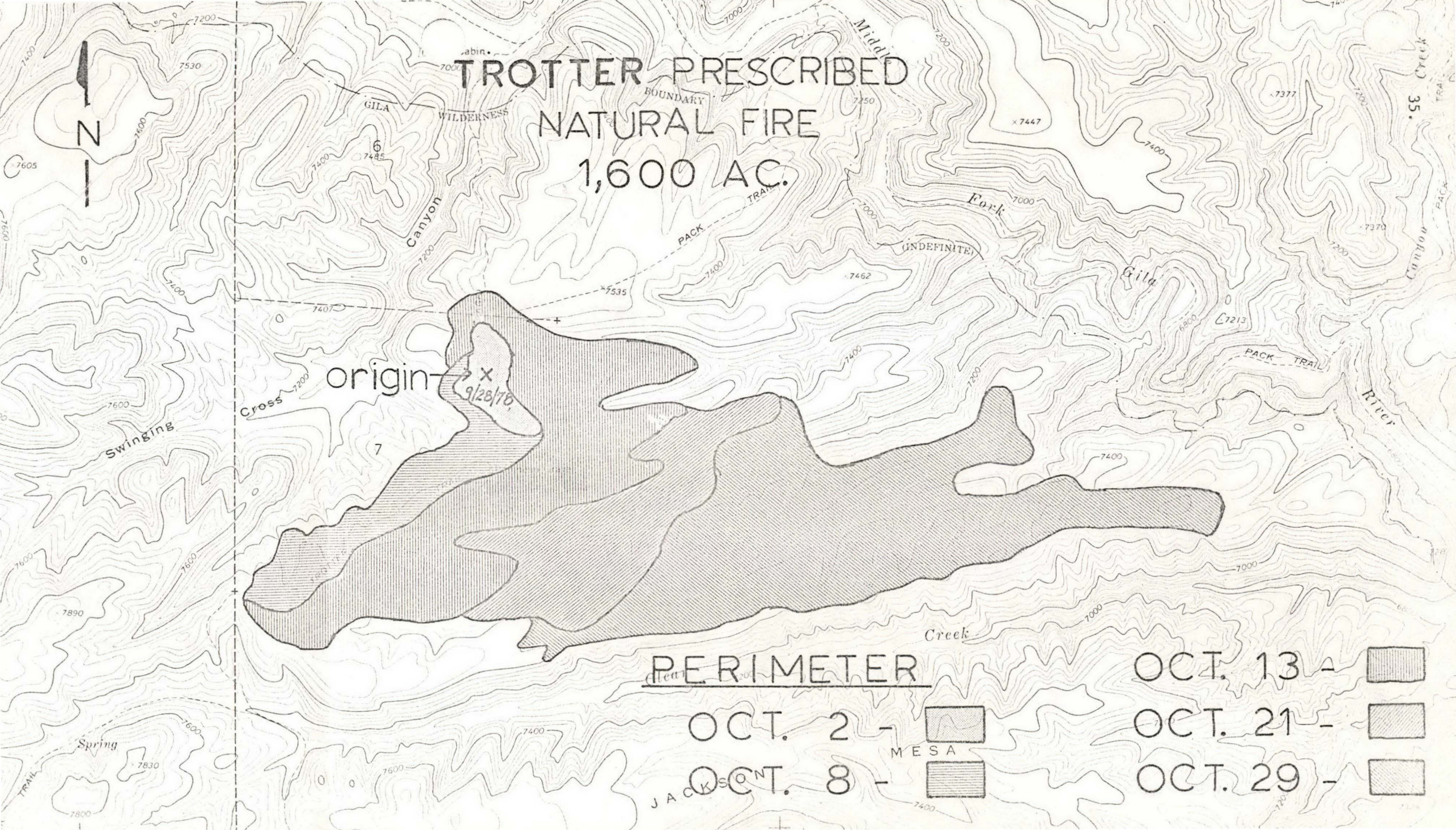
Summary:

The fire site was basically from flat ridge top into 30% slope canyon back on to flat ridge tops. Ponderosa pine, oak brush, consumption was better than 60-75%, live grass consumption was high, fallen snag consumption was 95-100%, freshly fallen snag consumption was a 60% on average. (see "Trotter" Fire Fuel Volume Map, p. 36)

Average Fuel Volume Calculation were $\frac{M}{P.P.M.C} \frac{2.0-1.5'}{3.0-2.0''}$

Total Acreage was 1,600.

Information for the "Trotter" Fire is limited, as with the "Nite" Fire, due to monitors being committed to the "Langstroth" Fire.



TROTTER PRESCRIBED
NATURAL FIRE
1,600 AC.

origin x
9/28/76

PERIMETER

OCT. 2 -

OCT. 8 -

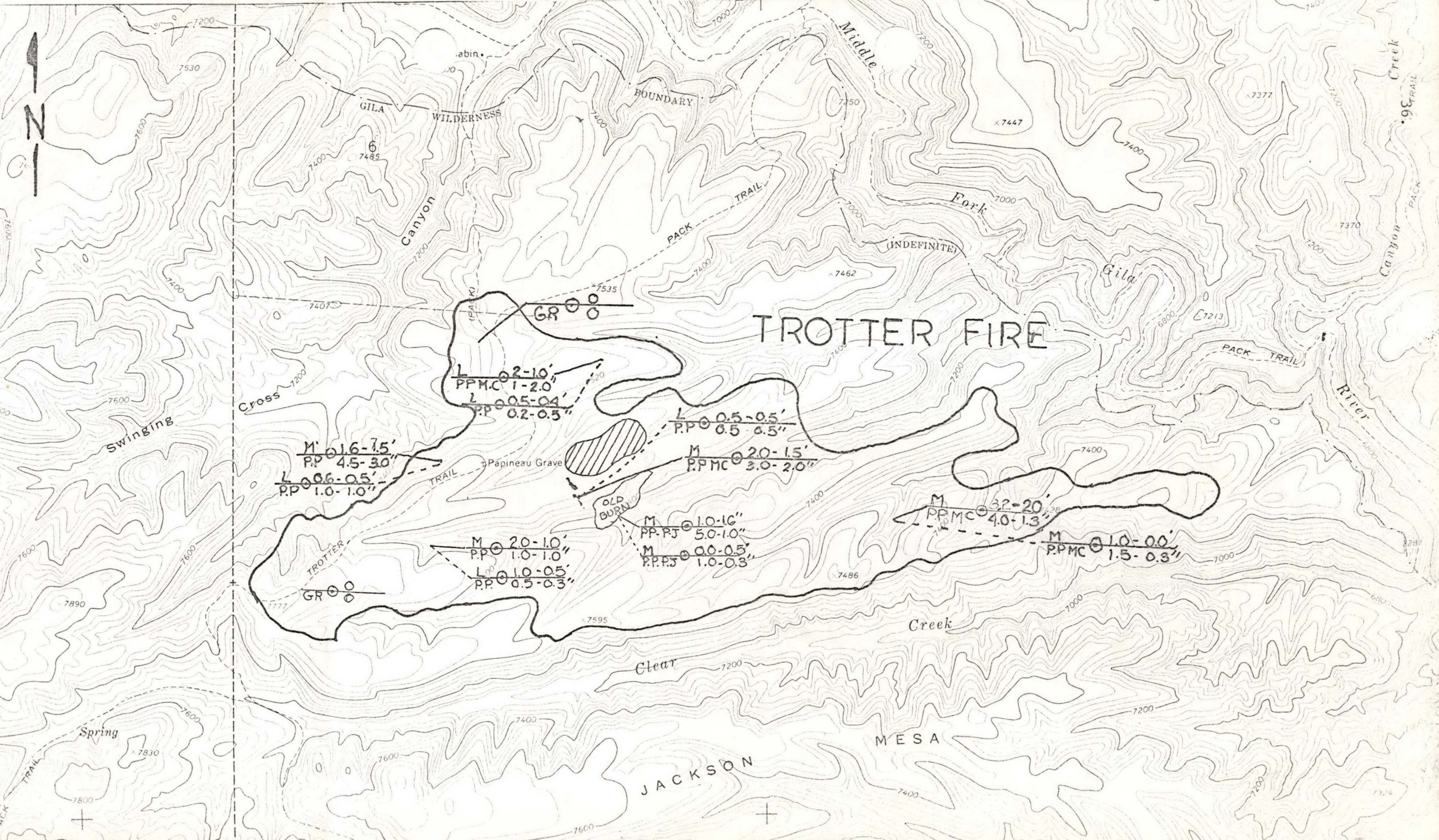
OCT. 13 -

OCT. 21 -

OCT. 29 -

MESA

JACKSON



TROTTER FIRE

GR 0 0

L 0 2-10'
PPMC 1-2.0'
L 0 0.5-0.4'
PP 0.2-0.3"

M 0 1.6-7.5'
PP 4.5-3.0'
L 0 0.6-0.5'
PP 1.0-1.0"

L 0 0.5-0.5'
PP 0.5-0.5"
M 0 2.0-1.5'
PPMC 3.0-2.0"

OLD BURN

M 0 1.0-1.0'
PP PJ 5.0-1.0"
M 0 0.0-0.5'
PP PJ 1.0-0.3"

M 0 3.2-2.0'
PPMC 4.0-1.3"

M 0 1.0-0.0'
PPMC 1.5-0.3"

M 0 2.0-1.0'
PP 1.0-1.0"
L 0 1.0-0.5'
PP 0.5-0.3"

GR 0 0

Clear

Creek

MESA

JACKSON

Swinging

Spring

GILA

WILDERNESS

BOUNDARY

Middle

Fork

Gila

Creek

Canyon

River

ESCAPED FIRE SITUATION ANALYSIS					FIRE NAME P.N.F. TROTTER SLOPOVER EST. 300 ACRES		DATE 10/15/78		SHIFT NO.	
ALTERNATIVES CONSIDERED	ECONOMIC CONSIDERATIONS					OTHER CONSIDERATIONS				
	A. PROJECTED DATE OF CONTROL	B. PROJECTED BURNED ACRES	C. PROJECTED NET EFFECT ON RESOURCES & PROPERTY	D. PROJECTED SUPPRESSION & REHA- BILITATION COSTS	E. TOTAL PROJECTED NET EFFECT	A. SAFETY OVERALL 10=SAFEST	B. CONFIDENCE LEVEL 10=HIGHEST	C. SPECIAL ENVIRON- MENTAL CONSIDERA- TION	D. SPECIAL CONSTRAINTS	DECISION ANALYSIS
PLAN A. NO CHANGE, LET THE FIRE CONTINUE TO BURN SINCE IT IS DOING NO RESOURCE DAMAGE.	—	?	POSITIVE EFFECT ON RESOURCE	NONE	POSITIVE NET EFFECT TO THE RESOURCE	10	5	WOULD NOT BE FOLLOW- ING THE APPROVED POLICY FOR PRESERVED NATURAL FIRE GILA WILDERNESS	—	THIS IS NOT A VIABLE ALTERNATIVE SINCE IT DOES NOT COMPLY WITH OUR PRESCRIBED NATURAL FIRE PLAN.
PLAN B. PATCH ONE HOT- SHOT CREW TO EXPEDITE A CONTROL LINE AROUND SLOP OVER	10/17/78	350	POSITIVE EFFECT ON RESOURCE	# 4400.00	LESS ACRES BURNED RESULTING IN NEG. EFFECT TO RESOURCE. COSTLY SUPP. ACTION.	7	8	CONFORMS TO ACTIONS RE- QUIRED IN OUR PNF PLAN. THIS IS MOST COSTLY ALTERNATIVE	OUR HOTSHOT CREW IS PRESENTLY IN R-2 ON A FIRE ASSIGNMENT WOULD HAVE TO REQUEST A CREW FROM ANOTHER FOREST.	THIS ALTERNATIVE IS NOT SELECTED DUE TO THE SUPPRESSION COSTS INVOLVED.
PLAN C. LEAVE 2 MEN PRESENTLY ON THE FIRE TO START BUILDING SCRATCH LINE SEND IN 2 MORE MEN TO ASSIST. ALLOW INTERIOR TO BURN ITSELF OUT	10/20/78	450	POSITIVE EFFECT ON RESOURCE	1760.00	NEGATIVE EFFECT TO RESOURCE HOWEVER LESS SUPP. COST INVOLVED	8	7	CONFORMS TO ACTIONS RE- QUIRED IN PNF PLAN, THIS IS LEAST COST- LY APPROACH.		<u>SELECTED ALTERNATIVE</u> DUE TO LOW SUPPRESSION COST AND THE FACT THAT NO RESOURCE DAMAGE IS EFFECTED,

John M. Williams
LINE OFFICER

DATE

J.R. Webb
FIRE-BOSS
FMO

DATE

10/15/78

1978 P.N.F. OCCURRENCE TABLE 5										
FIRE NAME	DATE DISC.	PREDICTED B.I.	PREDICTED ERC	SIZE ACRES	FUEL TYPE	SLOPE CLASS	ASPECT	% FUEL CONS.	DATE OUT	REMARKS
WILD	7-25	38	19	10	P.R. MC	3	SE		8-2	
SMIT	7-25	38	19	25	P.P. MC	5	E	Est. 80%	8-4	
SECO	7-25	38	19	SPOT	MC	2	W		7-31	
GRANITE	7-26	26	25	3	PP	5	N		8-1	
LANGSTROTH	7-29	42	32	3200	PP MC	2 & 3	All		11-15	Burn for 3½ mos.
CATRON	7-30	33	34	5	PP MC	2	NE		8-4	
RAWMEAT	7-30	33	34	5	PP MC	2	NE		8-1	
CABALLO	7-30	33	34	50	PP MC	1	FLAT		8-1	
WHITE ROCKS	8-1	43	31	5	PJ PP	1	FLAT		8-4	
WET	8-1	*27	*27	2	PP	1	FLAT		8-2	
CREEK	8-1	*27	*27	SNAG	PP	1	NE		8-3	
DEVIL	8-4	30	*27	2	PP MC	1	S		8-7	
NITE	8-8	28	26	860	PP	1 & 2	All	70%	11-15	
NEW MOON	8-8	28	26	50	PP MC	1	E&W	Est. 50%	8-30	
JUDE	8-8	28	26	5	PP	1	FLAT		8-10	
GILITA	8-8	28	26	5	PP MC	2	All		8-15	
HALF MOON	8-8	28	26	50	PP MC	1	N	Est. 65%	8-15	
DOT	8-11	34	27	90	PP MC	1	FLAT		8-17	

(continued)

FIRE NAME	DATE DISC.	PREDICTED B.I.	PREDICTED ERC	SIZE ACRES	FUEL TYPE	SLOPE CLASS	ASPECT	% FUEL CONS.	DATE OUT	REMARKS
EAGLE	8-11	34	27	SPOT	MC	4	N		8-17	
PINE	8-27	32	27	15	PP MC	4	N.W.		8-30	
SHIP	8-28	32	27	15	PP	2	S.W.	90%	9-5	
TROTTER	9-28	6	7	1600	PP	1	A11		11-15	

* Actual Indices - Predicted Not Available.

THE EVOLUTION OF P.N.F. PRESCRIPTIONS AND
IMPLEMENTATION OF FIRECAST

Changes in Prescription Criteria

Under the originally approved prescription for the Prescribed Natural Fire Program, fuel models and Burning Indexes were tied together. The following, from the original text, shows this tie-together:

Fire occurs in one of the following fuel models used to determine the fire danger rating.

G or H and measured fire danger is in the lower 1/3 of manning class IV or below and is not predicted to exceed this point.

C or D and measured fire danger is at midpoint of manning class III or below and is not predicted to exceed the midpoint.

A, B, or F, and measured fire danger is in manning class II or below and is not predicted to reach class III.

(Manning classes are determined from burning index.)

Of the above combinations, the fuel model that most accurately described the fuels on the Gila NF was the C model, and was used at all NFDRS weather stations to determine predicted indices.

The original criteria stated that the predicted Burning Index was not to exceed the mid-point of manning Level III, and if it did exceed such mid-point that a complete suppression activity was to be under-taken. Such action was implemented during the 1976 P.N.F. season. This restriction was removed prior to the 1977 P.N.F. season.

The 1978 revision of the National Fire Danger Rating System provided understandable definitions of the components and indices. The 1978 revision also provided more and refined fuel models, to accurately describe the fuel types and loadings. The Gila used the C and G fuel models at the NFDRS weather station associated with the P.N.F. program to determine the predicted indices.

The definitions of the components and indices produced another proposal to modify the prescription criteria. July 19, 1978, the Forest proposed and received approval to combine the Burning Index with the Energy Release Component for Prescription Guidelines, as follows:

FUEL MODEL C: Use prescribed natural fire when the measured fire danger for Gila Center C3P2 Model BI is 30 or lower and the ERC is 25 or lower or a sum of 55 or lower. Seasonal plots from FIRDAT show the prescription should cover about 98% of the days from July 15 through September 30. To insure that control is possible should it become necessary, this prescription is tighter than the prescription for Fuel Model G.

FUEL MODEL G: Use prescribed natural fire when the measured fire danger for Negrito G3P3 Model BI is 32 or lower and the ERC is 28 or lower or a sum of 60 or lower. Seasonal plots from FIRDAT show the prescription should cover about 54% of the days from July 15 through September 30. Because this fuel model is at a higher elevation with a more reliable moisture pattern, this prescription may have higher fire danger values than the other fuel models.

FUEL MODEL L: Use prescribed natural fire when measured fire danger for Negrito L1P2 Model BI is 12 or lower and the ERC is 3 or lower, or a sum of 15 or lower. Seasonal plots from FIRDAT show the prescription should cover about 96% of the days from July 15 through September 30. To insure that control is possible should it become necessary, the prescription for this model is tighter than prescriptions for other models.

It should be noted that the above proposed changes were a matter of correlation between the 1972 version of NFDRS and 1978 revision. It was not our purpose to modify objectives or intensity of the fires.

Because this was the first attempt to bring the P.N.F. area under the updated NFDRS, we realized that there would be a need to modify or fine tune this approach during or following our P.N.F. season.

Within the first month of use these prescriptions were felt to be too restrictive. This was proved by the above combinations being out of prescription, for the "Langstroth" P.N.F., and having to implement the two day delayed suppression criteria to see if we would fall back into prescription. In mid-August of 1978, with the Forest Supervisor's approval, the Forest reverted back to the criteria of the BI Level III mid-point. At this point the field monitors began relaying information that, with the easing of the restrictions, fire behavior on the "Langstroth" and "Nite" P.N.F.'s were finally beginning to produce objective results. These results were in terms of rate of spread, consumption of dead fuels and having very little scorching over most of the areas.

In an effort to better understand the predicted fire behavior characteristics, an AFFIRMS sub-program was introduced to the Gila. The Regional Office began relaying FIRECAST data.

FIRECAST

The first FIRECAST was relayed to the Gila on August 16, 1978. The basis of fire behavior characteristics was based on the C fuel model with a 15% slope factor and wind speeds from 0-20 M.P.H. with 5 M.P.H. increments.

Daily comparisons of the projected FIRECAST behavior and the actual on the ground monitored behavior produced many combinations of fuel models and slope factors, in an effort to bring the FIRECAST data closer to reality. The end product was a stylized fuel model, for the P.N.F.'s that was named the "LANG2" fuel model.

The actual weather conditions, significantly - wind speeds and fuel moisture, were used to extrapolate the actual fire behavior and to determine the predicted fire behavior from the FIRECAST data. This can be done for any time period of the day.

R.Van Gelder 1978	Wind at 20 Foot Height (MPH)				
	0	5.00	10.00	15.00	20.00
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Rate of Spread					
(Ft/Min)	1.44	6.02	18.45	38.08	64.59
(Chains/hr)	1.31	5.48	16.79	34.65	58.78
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Growth Rates					
Perimeter (CH/hr)	5.57	19.33	51.51	96.05	151.67
Area sq. ft/sq min	2.94	33.61	216.98	657.79	1378.86
Area(acres/sq hr)	0.24	2.78	17.98	54.36	113.96
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Byrams Intensity					
(BTU/sec/foot)	7.59	31.68	97.05	200.34	339.88
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Crown scorch ht					
on 77°F day (feet)	3.84	8.14	13.85	19.26	24.31
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Flame					
Length (feet)	1.14	2.21	3.69	5.15	6.57
Height (feet)	0.88	0.74	1.18	1.64	2.10
Reach (feet)	0.	1.24	2.38	3.62	4.91
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From the above FIRECAST data we can determine the fire behavior, or verify actual behavior, for any wind speed up to 20 m.p.h.. For example: with a forecasted wind speed of 7 m.p.h. we can figure that fire behavior, either actual or predicted, should approximate $\frac{1}{2}$ the difference of the 5 m.p.h. and 10 m.p.h. increment data. Thus, rate of spread approximates 12 ft/min.; growth rate approximates 35.42 ch/hr.; crown scorch height approximates 11 ft. (on a 77°F day), and flame lengths will be approximately 2.95 ft., 0.96 ft., and 1.81 ft. respectively. We realize that the exactness of FIRECAST depends on the exactness of the fuel model used and that is the primary reason for stylizing fuel models.

STATISTICAL DATA FOR 1978 P.N.F. SEASON

The summer season that preceeded the 1978 fire season had weather patterns that seemed to be conducive to a season for prescribed natural fire. There was precipitation in every month of 1978 and above average day-time temperatures. The moisture and temperatures combined to produce a grass crop that would carry a fire, and with the winds (average of 7 m.p.h.), had a slow rate of spread.

The NFDRS Weather Station at Gila Center recorded the following:

	Total Precip	Ave. Max Temp	Ave. Wind Speed	Ave. 10 HR T/L	Ave. C Model 1000 HR T/L
* 7/1 thru 7/23	0.92"	**94°F	7 m.p.h.	8	10.1
7/24 thru 7/31	0.17"	***91°F	5 m.p.h.	8	11.6
8/1 thru 8/31	4.02"	86°F	6 m.p.h.	9	13
9/1 thru 9/30	0.48"	83°F	7 m.p.h.	9	****13.7
10/1 thru 10/31	1.94"	77°F	5 m.p.h.	12	?
11/1 thru 11/30	4.08"	62°F	5 m.p.h.	17	?

* 23 days prior to Prescribed Natural Fire Season 1978.

** 11 days of 95⁰+ temps. - highest 98°F on 7/9 & 7/18.

*** 3 days of 95⁰+ temps. - highest 98°F on 7/30.

**** 21 days only.

CONCERNS FOR THE FUTURE OF OUR P.N.F. PROGRAM:

Those of us on the Forest who have been directly or indirectly involved with the P.N.F. Program, are quite pleased with our accomplishments to date, especially this past season.

At the same time, we have two concerns for the future.

1. RESEARCH: As time passes, we continue to learn more about the behavior of P.N.F. fires, dispersal patterns, fuel reductions, etc.. The more ignitions we have, the larger our data base grows. In time this will aid us in the refinement of prescriptions, overall management, and a basis for management goals.

We need more scientific data relative to the true ecological effects P.N.F.'s create. Our present ground monitors are doing a good job, however, they are trained and equipped to only supply us with minimal, basic data on weather and fuels, and can only pass on to us their personal observations relative to fire effects.

Fire research personnel from the Rocky Mt. Station assigned to the Forestry Science laboratory at Arizona State University in Tempe, Arizona have been most cooperative and have provided us with valuable assistance to date. Due to other research priorities, plus the new Fire Management Policy, we foresee many additional P.N.F. or fire management areas being developed throughout the region. Hopefully, research will be able to provide us with the necessary scientific data relative to ecological effects resulting from all prescribed fire.

2. Is there a need for predetermination of the number of, and size limitations, for P.N.F.'s occurring in our Fire Management areas?

The 1978 P.N.F. season was very successful in our eyes. At the close of our P.N.F. season we had a total of 22 fires burning some 5,947 acres. We experienced very few problems. We also recognize that situations can change rapidly. Had we experienced the need to initiate total suppression action on any or all of the three larger P.N.F.'s burning concurrently we would not have had the necessary resources on the Forest to do so.

We are also concerned when we read newspaper articles such as the following:

"Fire Panel Backs Burns - A special 5-member review board, formed after strong criticism of natural-burn policies of the Park Service, will recommend that the NPS continue its natural-burn policy in Rocky Mountain NP, says the Rocky

Mountain News (Denver). A fire last August, burned for a month and then flared out of control, threatening a town, burning 1,000 acres of mountain timber, and requiring more than 1,000 men to contain it. NPS spokesman says an experienced fire-control officer should have been called in earlier."

The problem, as we see it, is not the lack of experienced fire management officers who can anticipate problems, but rather the magnitude of manpower needs and logistical problems once a fire or fires reach a large size in a very remote wilderness area.